



Fall 99 Volume XV Issue 3

Cleared for Public Release - Distribution Unlimited

SURVIAC Bulletin

Survivability/Vulnerability Information Analysis Center

SURVIAC is a U.S. Department of Defense Information Analysis Center (IAC) sponsored by the Defense Information Systems Agency (DISA), Defense Technical Information Center (DTIC).

New Applications Developed After Additional Foam Testing

An article in SURVIAC Current Awareness Bulletin Vol XIV, No. 1, 1998 described the development of a new type of foam for use as a fire suppressant. Additional testing has been accomplished with this foam and new applications have been developed. Both of these aspects are addressed below.

The fire fighting ability of the foam system was demonstrated at the US Navy Surface Warfare Center at China Lake, California. Halon 1211 was used as the gas in the foam. The extremely difficult "Nimitz" three-dimensional fire scenario was extinguished in eighteen seconds with only one fire hose and using less than fifty gallons of water. (See Figure 1.) The Nimitz fire scenario was designed based on the disastrous fire that happened on the carrier USS Nimitz in 1981 when an EA-6B Prowler crash landed on the flight deck, killing 14 crewman. In that instance, the fire fighters had a pile of destroyed aircraft that were spilling fuel on the deck. The debris covered part of the falling fuel and the foam system used was not effective. Three-dimensional refers to a flowing fuel fire. Since the fuel is falling from the fuel tank, it can't be covered with a blanket of smothering foam. To address this phenomenon, halon or an environ-



Figure 1. Nimitz Fire Scenario Test

mentally friendly replacement agent is put in the foam. This gas carried by the foam will extinguish the flowing fuel while the foam itself seals the surface fire. Halon is no longer being produced but there are other replacement chemicals that can equal its fire fighting ability when used in the foam.

The compressed foam has another unique ability. When foam freezes, its characteristics are very similar to snow instead of ice. Ice can immobilize vehicles and freeze the hose to the ground so that it can not be moved. Heavy ice from water pumping can crush structures and is treacherous to walk on. The frozen foam has very little weight compared to solid ice. It sticks together and is not easily blown by the wind

and actually improves traction over glazed ice. A small 80-gallon compressed foam unit can be made for towing behind a snow mobile, or air lifted by aircraft. It has an insulated cover and is fitted with a heating element that is connected to the battery of the vehicle to keep the water solution from freezing. This unit produces two thousand gallons of foam that will extinguish fires larger than a full sized fire truck on tank water.

OTHER FIRES

Other fire suppression applications include subsurface fires in coal mines and municipal waste landfills. The compressed foam is not effected by high back pressure so it is

Continued on page 6

In This Issue:

Cover Story: New Applications Developed After Additional Foam Testing	1
SURVIAC POCs	2
SURVIAC Providing Technical and Business Solutions in Evaluating Halon Replacement Systems	3
We've Moved! SURVIAC Web Page Update	5
Product Availability	8
Model Availability	9
Model Spotlight: BLUEMAX IV	10
Model News	12
JTCG/ME Air Target Repository	13
Calendar of Events	15
SURVIAC Inquiry Services	16
Information Request	16



SURVIAC Bulletin Vol XV Issue 3

SURVIAC, a DoD Information Analysis Center (IAC), is administratively managed by the Defense Information Systems Agency (DISA), Defense Technical Information Center (DTIC), under the DoD IAC Program. SURVIAC is sponsored by the Joint Technical Coordinating Groups on Aircraft Survivability (JTCG/AS) and for Munitions Effectiveness (JTCG/ME). SURVIAC is operated by Booz•Allen & Hamilton Inc. The Contracting Officers Technical Representative (COTR) for the Center is Mr. Martin L. Lentz, 46 OG/OGM/OL-AC, 2700 D Street, Bldg. 22B, Wright-Patterson AFB Ohio 45433-7605. He may be reached at DSN 785-6302 or (937) 255-6302.

Inquiries about SURVIAC's capabilities, products and services, or comments regarding this publication may be addressed to:

AFRL/VACS/SURVIAC BLDG 45
2130 Eighth St. Ste. 1
Wright-Patterson AFB, OH 45433-7542
Com: (937) 255-4840, DSN 785-4840
Fax: (937) 255-9673
E-Mail: surviac@va.wpafb.af.mil
URL: <http://iac.dtic.mil/surviac>

SURVIAC Points of Contact

Com: (937) 255-4840,
DSN: 785-4840
Fax: (937) 255-9673

Kevin Crosthwaite
SURVIAC Director
E-mail: crosthwaite_kevin@bah.com

Donna Egner
SURVIAC Deputy Director
E-mail: degner@bah.com

Gerald Bennett
Survivability Analyst
E-mail: gbennett@bah.com

Jon Carroll
Research Assistant
E-mail: jcarroll@bah.com

Susan Green
Administrative Services Manager
E-mail: sgreen@bah.com

Geri Bowling
Model Administrator
E-mail: gbowling@bah.com

Linda Hamilton
Model Manager
Com: (937) 431-2746
E-mail: hamilton_linda@bah.com

Mike Bennett
Model Manager
Com: (937) 431-2707
E-mail: bennett_michael@bah.com

Theron Niekamp
Computer Services
E-mail: tniekamp@bah.com

Michael Shanley
Computer Services
E-mail: mshanley@bah.com

Jason Burden
Computer Services
E-mail: jburden@bah.com

Linda Ryan
SURVIAC Bulletin
E-mail: liryan@bah.com

Visit our web site !
<http://iac.dtic.mil/surviac>

E-mail SURVIAC!
surviac@va.wpafb.af.mil

SURVIAC Providing Technical and Business Solutions

INTRODUCTION

SURVIAC is applying business solutions with technical expertise in evaluating halon replacement systems. The banning of halon production and the search for nonhalon fire extinguishing alternatives have produced sizable development programs in Government, university, industry, and research and development (R&D) organizations. This SURVIAC Technical Area Task (TAT) will evaluate multiple platforms and multiple agents taking financial and technical variables into consideration. The fixed and variable costs associated with converting to fire suppression alternatives from conventional Halon 1301 systems are considerable. Quantification/qualification of costs and benefits will enable the decision maker to come up with the optimum solution. The goal of this task is to assist decision makers in selecting a retrofit halon replacement system, but it is also proving a cost benefit methodology with wider applications.

worst known ODC per unit mass, making them the first chemical family to be eliminated. Originally planned to be phased out of production by the year 2000, this deadline was accelerated to January 1994. This now leaves only existing stocks of halon for use in essential applications such as aircraft fire and explosion suppression systems.

Out of sizeable programs have come a rapid evolution of a wide variety of fire protection technologies. This is expected to continue for some time, especially with the advent of the DoD Next Generation Fire Suppression Technology Program (NGP). The goal of the NGP is to develop and demonstrate, by 2005, retrofitable, economically feasible, environmentally-acceptable, and user-safe processes, techniques, and fluids that meet the operational requirements currently satisfied by Halon 1301 systems in aircraft, ships, land combat vehicles, and critical mission support facilities. SURVIAC is supporting the NGP by means of various TATs.

“Out of sizeable programs have come a rapid evolution of a wide variety of fire protection technologies.”

Continued on page 4

BACKGROUND

International concern for the apparent depletion of stratospheric ozone has led to agreement to eliminate synthetic production of ozone depleting chemicals (ODCs). Recent studies have shown halons are the

Table 1. Vehicle Types, Platforms, Applications and Agents Considered

VEHICLE TYPE	PLATFORMS	APPLICATIONS	AGENTS
Ground Vehicles	M992 (FAASV Ammunition Resupply Vehicle) M1 Tank Series M2/M3 (Bradley Personnel Carrier)	Crew Compartments	Halon 1301 HFC 125 HFC-227ea
Aircraft	C-130 F/A-18 C/D C-17 H-60 (Blackhawk Helicopter) CH-47 (Chinook Helicopter) F-16	Dry Bays Engine Nacelles Fuel Tanks	CF ₃ I Water Mist Dry Chemicals
Ships	DDG 51 (Arleigh Burke Class—AEGIS Guided Missile Destroyer) LHD 1/LHA 1 (WASP/LHA1 (TARAWA) Class—Amphibious Helo/Landing Craft Carriers)	Storage Compartments Machinery Spaces	Gas Generators

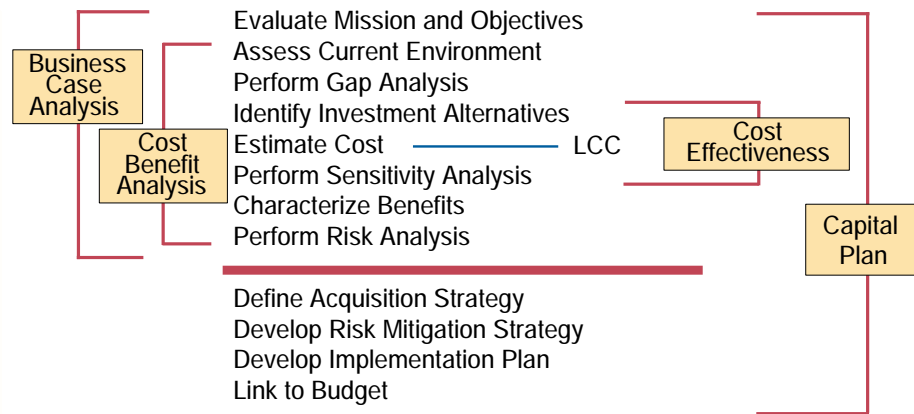


Figure 1.
Investment
Analysis

CURRENT SURVIAC TASK

“The objective of a CBA is a systematic method of assessing the economic alternatives based on their respective costs and benefits.”

In the current SURVIAC TAT, the process of a Cost Benefit Analysis (CBA) will be used to evaluate life cycle costs and benefits. Out of this CBA process, decision makers will be able to evaluate fire suppression alternatives. The vehicle types, platforms, applications and agents being considered in this study are given in Table 1. The impacts of modifying different parameters of suppression systems are also being assessed. Recommendations of areas for best exploitation will be prepared.

A cost benefit analysis is a part of an overall investment analysis. Figure 1 depicts the relationship between the various elements.

The objective of a CBA is a systematic method of assessing the economic alternatives based on their respective costs and benefits. The alternatives are expected to have varying levels of both costs and benefits. CBA methodology is as follows:

1. Identify investment options
2. Narrow alternatives
3. Determine investment objectives
4. Establish decision criteria
5. Calculate life-cycle costs
6. Estimate dollar benefits
7. Describe qualitative improvements
8. Calculate financial metrics
9. Perform sensitivity analysis
10. Recommend preferred alternative

Below is an example of typical inputs/outputs and guidance/tools used in cost benefit analyses.

Within time and budget constraints, the following items will assist in applying the cost benefit analysis process to the realm of fire suppression.

- Tailor the typical CBA process to this project.
- Develop a common set of ground rules and assumptions.
- Develop a comprehensive cost element structure to organize costs across alternatives.
- Develop a comprehensive benefit structure.
- Evaluate potential impacts resulting from platform modification into the CBA process.
- Identify data sources for cost and benefit variables.
- Identify data collection techniques for cost and benefit variables.
- Determine estimating methodologies for evaluating various cost elements.
- Determine methodologies for evaluating benefits.
- Identify cost drivers.
- Determine methods for evaluating uncertainty and risk.
- Develop CBA process / collect data / make estimations / analyze benefits for one platform (to be determined) for all alternatives.

- Develop CBA process / collect data / make estimations / analyze benefits for all platforms for all alternatives.

ENHANCED SURVIAC OFFERING - COST BENEFIT ANALYSES

With the recent addition of a cost analyst, the capability to perform life-cycle cost estimating, cost effectiveness analysis, cost benefit analysis, business case analysis, and capital planning has enhanced the SURVIAC offering capabilities. This enhancement will enable SURVIAC customers to not only have the technical solution, but also the business solution.

This CBA capability is also currently being offered and utilized via a SURVIAC TAT to the F-22 System Program Office. Under a previous SURVIAC TAT, an evaluation of fire suppression alternatives was performed for the F-22 dry bay application.

SUMMARY

With many entities competing for limited R&D budgets, facilities, and expertise, it has become necessary to develop a R&D assessment methodology. This methodology will compare, rate, and evaluate these competing technologies in order to select the most promising for further R&D, to assess the potential benefits and costs of each, and to develop a rational funding profile for each technology and the R&D program as a whole. SURVIAC is utilizing/providing a cost benefit analysis process to satisfy this requirement. In today's environment, the technical solution must be accompanied with a business solution to ensure its success.

*For more information please contact Ms. Ginger Bennett
at (937) 431-2706 or by E-mail at
bennett_ginger@bab.com.*

We've Moved! SURVIAC Web Page Update

Your favorite internet web page has moved. To avoid that lost and abandoned feeling look for the SURVIAC web page at its new address - <http://iac.dtic.mil/surviac>. This move is part of a DTIC effort to consolidate all IAC web pages onto a central server. Over the coming months each of the DTIC IACs will be moving their web pages to a common server at DTIC. Consolidation will improve security and will help standardize common features of the various DTIC IAC web pages bringing a common look and feel across all of these sites.

During the first quarter of year 2000, a redesign of the SURVIAC web site will take place. Updated information and an improved layout will be incorporated into the redesign making it easier to locate and use the information on our site. The overall site design will be restructured and popular items such as the SURVIAC Calendar of Events and the SURVIAC Bulletin will be positioned for easy access to the most relevant information. New tools will also be added giving the user the ability to update his/her email address, mailing address, phone, fax and other data.

SURVIAC Bulletins and Aircraft Survivability Newsletters will be available for download as PDF files. This enhancement will allow users to access these publications in an electronic format while incorporating the same look and feel as the print version. An email notification list will also be added to the site. This functionality will notify individuals when certain pages of interest are updated. Users who sign up for this service won't need to continually check the web site for updates and new information. An email message will be sent to these users whenever new items of interest are added.

SURVIAC is excited about the upcoming changes. The redesigned SURVIAC web site should give users easier access to more information.

“ The foam sticks to contaminated surfaces and seals in any odors or infectious gases while the reactive agents kill the disease-causing microbes.”

possible to pump it in large quantities through long lengths of hose and pipe. The Bureau of Mines has used this foam system to inject nine million gallons of dense, soaking foam into a mine fire in Kentucky. The flow rate was six thousand gallons per minute and it filled the tunnels from the floor to the ceiling and was pushed into the cracks and crevices through the rubble and debris to completely extinguish the fire that had burned for years. Smaller compressed foam systems have been used to inject the foam into buried waste at landfill fires. The surfactants in the foam penetrate the hydrocarbons and soak even waterproof waste to extinguish the fire. Foam is the only product that can fill the voids and follow the burned out channels beneath the surface.

CHEMICAL/BIOLOGICAL

This foam-generating concept can also be used in chemical/biological decontamination applications. Cummins Industries Inc. has taken an obsolete military twin agent fire fighting unit that has a banned halon system and converted it into a reactive foam generator. (See Figure 2.) The foam that this unit creates is very dense and acts as a carrier solution for disinfectant chemicals such as sodium hypochlorite and triethylene glycol. Both of these products are common disinfectants that are widely used for industrial and civil decontamination and sterilization applications. Other products can be used with this method of application as well.

The liquid tank of the old halon unit will now generate as much as two thousand gallons of

reactive foam that can be pushed through long lengths of lightweight hose. The unit uses nitrogen or compressed air as the foaming gas and does not require any type of pump to propel the dense mass. The unit is extremely simple to operate. The operator only needs to open the cylinder valve to charge the hose and then open the nozzle valve to apply the foam. The foam sticks to contaminated surfaces and seals in any odors or infectious gases while the reactive agents kill the disease-causing microbes. There is no run-off when using this foam, which prevents the spread of contamination and greatly improves the removal and clean up operation. The foam will emulsify oily surfaces and hold the contaminated products in suspension, making them easy to be removed by vacuum or physically placing them into containers.

The U.S. Navy Surface Warfare Center, Dahlgren, Virginia, has entered into a Cooperative Research and Development Agreement (CRADA) with Cummins Industries to develop this foam equipment and to produce testing quantities of the Navy's Quaternary Ammonium Complex (QAC) chemical/biological warfare decontamination agent. It is believed that the use of the foam as a chemical application method will greatly enhance the ability of the Navy product to neutralize the most dangerous warfare agents.



Figure 2. Chemical/Biological Decontamination Foam Unit



Figure 3. Surface Septic Decontamination

NATURAL DISASTERS

This sterilizing foam can also be very useful during natural disaster incidents such as the earthquakes in Turkey and the flooding along the East Coast of the U.S. caused by hurricane Floyd. Dead animal carcasses can be covered with the foam to kill disease-causing microbes and seal the odors - while preventing insect infestation. The foam suffocates the insects by covering the insect's breathing orifices with countless thin films of surfactants and water. The surfactants are also very effective degreasers that chemically attract hydrocarbon molecules and hold them in suspension on the surface of the water, making them safe for removal.

After the initial sterilization to kill the undesirable disease-causing microbes, the reactive chemicals self-degrade to harmless by-products and the foam generating system can then be switched to using selected, packaged, safe microbes in the foam solution for bioremediation. In this mode of operation, the foam becomes the activating medium for the hybrid microbes that con-

sume the wastes and raw sewage that remain after the disaster.

Slit trenches and septic pools can be covered with the dense reactive foam to reduce the odor by sealing it and using the safe microbes to control disease. (See Figure 3.) This is another place that the foam can be used to prevent insect problems. Mosquitos that land on the foam get stuck and suffocate. The air-breathing larvae that are in the water cannot get air through the foam. The foam is often sprayed into the air to control swarms of dangerous flying insects such as the Africanized bees and swarms of angry wasps. It is often used to control the hazards of floating ants during floods.

SUMMARY

Thus, this foam obviously has multiple potential uses. This is a great example of a survivability/vulnerability technology being transferred successfully to the wider community.

For more
information
please contact
Mr. Matt Kolleck,
(937) 431-2702
or E-mail at
kolleck_matt@bah.com

SURVIAC Product Availability

SURVIAC is a U.S. Department of Defense Information Analysis Center (IAC) sponsored by the Defense Technical Information Center (DTIC)

Products

Product	Classification	Reproduction & Handling Fee
A Critical Review of Graphite Epoxy Laser Damage Studies	SECRET	\$ 50.00
A Summary of Aerospace Vehicle Computerized Geometric Descriptions for Vulnerability Analyses	Unclassified	\$100.00 (Free to Gov't)
Advanced Materials for Enhanced Survivability	SECRET	\$100.00
Aircraft Engine Analysts Reference Manuals (ARM) - 9 Volumes	SECRET	\$400.00/Per Set
Aircraft Fuel System Fire and Explosion Suppression Design Guide	Unclassified	\$150.00/3 Volumes
'Aircraft Survivability' Video	Unclassified	\$ 50.00 or 30-Day Loan
Alternatives For Halon 1301 In Army Ground Vehicle Firefighting Systems	Unclassified	\$250.00
An Overview of Laser-Induced Eye Effects	SECRET	\$150.00
An Overview of Laser Technology and Applications	Unclassified	\$ 50.00
Army Survivability Information Resource Database	Unclassified	\$200.00
'Battle Damage Repair of Composite Structures' Video	Unclassified	\$ 75.00
Collection of Vulnerability Test Results for Typical Aircraft Systems and Components	CONFIDENTIAL	\$150.00
Comparative Close Air Support Vulnerability Assessment Study - Executive Summary	SECRET	None (Gov't. Only)
Compendium of References for Nonnuclear Aircraft Survivability (A Supplement to MIL-HDBK-336)	Unclassified	\$150.00
Component Vulnerability (Pd/h) Workshop Component Pd/h Handbook w/addendum	SECRET	\$200.00 (Free to Gov't)
Countermeasures Handbook for Aircraft Survivability (3 Volumes)	SECRET	\$200.00 (Free to Gov't)
Critical Review and Technology Assessment (CRTA) for Soldier Survivability (SSv)	Unclassified	\$ 50.00
'Designing for Survivability' Video	Unclassified	30-Day Loan
DOD Directive 5000.1 and DOD Instruction 5000.2/5000.2M Survivability Excerpts	Unclassified	\$ 50.00 (Free to Gov't)
Fuel Tank Ullage Explosion Hazard State-of-the-Art Report (SOAR)	Unclassified	\$ 50.00
Gas Explosion Suppression Agent Investigation	Unclassified	\$200.00
Joint Live Fire/Live Fire Test Program Catalogue, Version 3.1	Unclassified	\$ 95.00
Joint Live Fire Test Program Aircraft Systems FY86, 87, 88 and FY88-90 Videos	Unclassified	\$ 50.00/Each
National MANPADS Workshop: A Vulnerability Perspective Proceedings 2 Volumes	SECRET	\$200.00
Penetration Characteristics of Advanced Engine Materials	Unclassified	\$100.00
Proceedings of the Eighth DOD Conference on DEW Vulnerability, Survivability and Effects - 2 Volumes	SECRET	\$125.00/Per Set
Proceedings of the National MANPADS Workshop - A Vulnerability Perspective -2 Volumes	SECRET	\$100.00/Volume
RADGUNS 1.8 Parametric Study	SECRET	\$100.00 (Free to Gov't)
Ship Survivability Overview	Unclassified	\$ 50.00
'SURVIAC - A Capabilities Overview' Video	Unclassified	30-Day Loan
Survivability Systems Master Plan	Unclassified	\$ 50.00 (Free to Gov't)
Testing of Aircraft or Aircraft Surrogates with On-Board Munitions	Unclassified	\$100.00
"Threat Effects in Aircraft Combat Survivability" Video	Unclassified	\$150.00 or 60-Day Loan
Unmanned Aerial Vehicles Survivability Compendium—Interim Report Database	Unclassified	\$200.00
U.S. Air Force Surface-To-Air Engagements During Operation Desert Storm	SECRET	\$100.00 (Free to Gov't)
Vulnerability Reduction Design Guide for Ground Systems in a Conventional Combat Environment	Unclassified	\$200.00

For further information on how to obtain these products and how to establish need-to-know certification, please contact SURVIAC at (937) 255-4840 or DSN 785-4840. Requests from non-U.S. agencies must be forwarded to their country's Embassy in Washington DC, Attn: Air Attache's Office.



SURVIAC Model Availability

SURVIAC is a U.S. Department of Defense Information Analysis Center (IAC) sponsored by the Defense Technical Information Center (DTIC)

Model	Classification	Reproduction & Handling Fee	
		Model	Documentation
MIL-AASPEM — Man-in-the-Loop Air-To-Air System Performance Evaluation Model	Unclassified	\$500.00	\$ 80.00 ⁺
AIRADE 7.4—Airborne Radar Detection Model	Unclassified	\$500.00	\$ 36.00
ALARM 4.1—Advanced Low Altitude Radar Model	Unclassified	\$500.00	\$ 60.50 ⁺
BLUEMAX IV—Variable Airspeed Flight Path Generator	Unclassified	\$500.00	\$ 15.00 ⁺
BRAWLER 6.3—Air-To-Air Combat Simulation	SECRET	\$500.00	\$231.50 ⁺
BRL-CAD—Ballistic Research Laboratory Computer-Aided Design Package*	Unclassified	\$500.00	N/A
COVART 4.1—Computation of Vulnerable Area and Repair Time	Unclassified	\$500.00	\$ 37.00
DIME—Digital Integrated Modeling Environment	Unclassified	\$500.00	\$ 63.00
ESAMS 2.8.2—Enhanced Surface-To-Air Missile Simulation	SECRET	\$500.00	\$295.50 ⁺
FASTGEN 3.2—Fast Shotline Generator	Unclassified	\$500.00	\$ 52.00
IVIEW 2000—Graphical User Interface for Output Simulation	Unclassified	\$100.00	+
JSEM - Joint Service Endgame Model	Unclassified	\$500.00	TBA*
LELAWS 3.0—Low Energy Laser Weapons Simulation	Unclassified	\$500.00	\$ 31.50
RADGUNS 2.2—Radar-Directed Gun System Simulation	SECRET	\$500.00	\$ 69.50 ⁺
TRAP 3.1a—Trajectory Analysis Program	Unclassified	\$500.00	\$256.00
TRACES—Terrain/Rotorcraft Air Combat Evaluation Simulation	Unclassified	\$500.00	\$127.00

* For more information regarding BRL-CAD or JSEM documentation, contact Mr. Bob Strausser at the SURVIAC Aberdeen Satellite Office, (410) 273-7722.

+ Documentation included with code on CD version of Model at no charge



For further information on how to obtain these models and how to establish need-to-know certification, please contact SURVIAC at (937) 255-4840 or DSN 785-4840. Requests from non-U.S. agencies must be forwarded to their country's Embassy in Washington DC, Attn: Air Attache's Office.

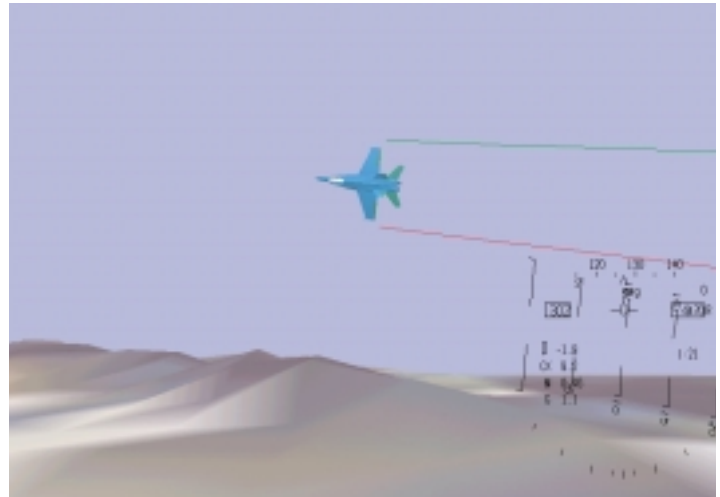
Models

BLUEMAX IV Now Available

Starting in July of this year, SURVIAC began distributing the newest version of BLUEMAX, BLUEMAX IV Release 1.0. This new version is an upgrade from BLUEMAX III Version 2.0, released April, 1997. This program, whose upgrade was funded by the Joint Technical Coordinating Group on Aircraft Survivability, is an aircraft flight path generator and mission performance evaluation model. BLUEMAX IV is a useful tool with which a user can construct detailed flight paths for fixed-wing aircraft for input into models such as RADGUNS and ESAMS. The model is also useful as a standalone tool for determining aircraft performance characteristics. In addition, the model has the capability to utilize National Imagery and Mapping Agency (NIMA) terrain information to construct terrain following/terrain avoidance flight paths and determine line of sight information for a user-defined set of ground threats thereby giving the user the capability to perform exposure studies and quick survivability estimates, as well as mission planning.

BLUEMAX flight paths are constructed as a sequence of flight segments. The flight profile during each segment is controlled by a set of command variables such as heading, altitude, velocity, and flight segment time duration along with a set of aircraft specific maneuver limits such as maximum G-factor and maximum roll rate. During each flight segment, BLUEMAX models the flight of the aircraft. The aircraft performs maneuvers by changing its roll angle, G-factor, throttle setting, and speed brake setting.

The program comes with a User's Manual (updated Programmer's Manual and Analyst's Manual were recently funded and



BLUEMAX IV

currently under development). The significant new software features and improvements from BLUEMAX III Version 2.0 include the following:

- 1) Coordinate Systems. In conjunction with the BLUEMAX, ESAMS, ALARM, RADGUNS, and DIME (BEARD) alliance, the inertial and body coordinate systems were changed to match the new BEARD standard. This new standard will avoid the nuisance of converting coordinate systems between new versions of the alliance models. The Inertial coordinate system is East (X), North (Y), and Up (Z) and Body coordinates are Nose (X), Right wing (Y), and Down (Z).

- 2) New terrain processing. The original BLUEMAX terrain implementation (triangular terrain and full digitized terrain elevation data, DTED) which required both a preprocessing step and supporting library files has been replaced with the new ESAMS, ALARM, RADGUNS (EAR) Common Environment terrain module which allows BLUEMAX to process terrain directly from a DTED CD-ROM. This new terrain implementation requires much less code and functions on PC's as well as UNIX machines.

- 3) Fortran 90. The new EAR terrain module described above was written in Fortran

90 and as such, BLUEMAX IV requires a Fortran 90 compliant compiler.

4) Aircraft Data File Update. The aircraft data file format has been modified to include a g-factor limit for each external weapon store. In addition, the terrain following/terrain avoidance (TF/TA) constants were removed from the aircraft data file and set as Fortran parameters. Note that the aircraft data files have a ".BM4" extension which the model assumes when loading.

5) Automated command updates. Minor modifications were made to the HEAD-ING SEQUENCE and MANEUVER SEQUENCE commands.

6) New interactive command. The new "BACK" command allows the user to rewind the current profile by stepping back a specified number of interactive commands (up to 100 commands).

7) Windows Graphical User Interface (GUI). For PC users, a Windows GUI for the BLUEMAX IV model is included which helps build input scenario files and simplifies model execution.

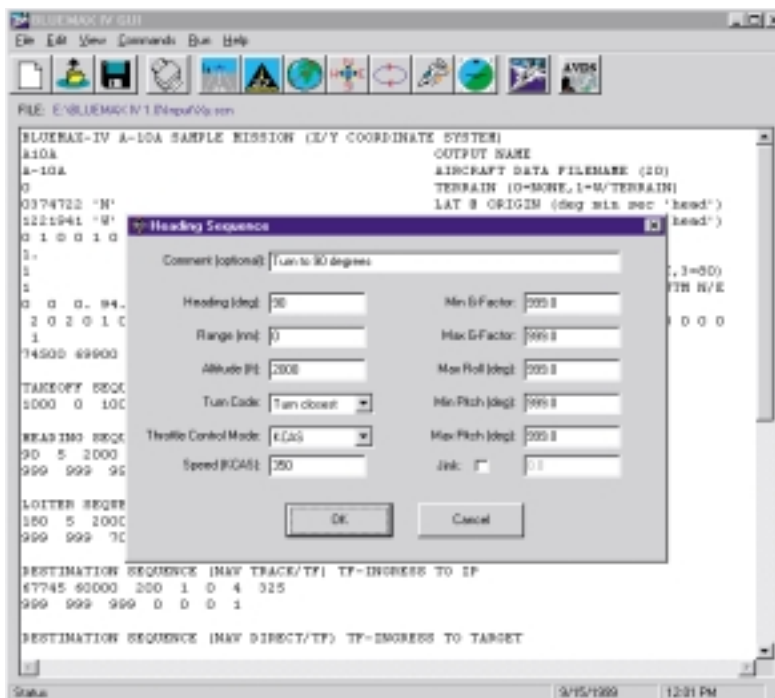
MINIMUM REQUIREMENTS

BLUEMAX IV Release 1.0 was concurrently developed on Sun SPARCstations under Solaris 2.6 using Sun Workshop 4.2 and on PC's under Windows 95 and NT using Digital Visual FORTRAN 6.0 (both compilers are Fortran 90 compliant). The Fortran code, aircraft database, and sample input scenario files require only 1 MB of storage. BLUEMAX IV will run on a variety of platforms that have a Fortran 90 compiler (e.g., HP, VAX, Silicon Graphics, etc.). BLUEMAX IV has three different interactive display modes - two standard outputs suitable for display on all platform types, and a BLUEMAX IV Run Screen that is compatible with most workstations to allow for large window displays. The display method used is selected by the user via the input scenario file and is important to note when running the model on your particular system.

This new version is available directly from SURVIAC on CD-ROM which includes both the PC and UNIX versions, as well as the User's Manual in Adobe Acrobat (PDF) format. The PC version includes a

compiled executable which can be used immediately upon installation.

*Order requests can be directed to Mrs. Geri Bowling at SURVIAC
Com: (937) 255-4840, DSN 785-4840. or
E-mail: gbowling@bah.com. Technical questions should be directed to
Mr. Steve Ames, ASC/ENM
(937) 255-1276 or
Mr. Michael Bennett, SURVIAC,
Com: (937) 431-2707.*



New BLUEMAX IV GUI

Model Spotlight

New SURVIAC Model E-mail Address

After the last issue of the SURVIAC Bulletin went to press, SURVIAC was issued a new E-mail address for all model inquiries. We apologize for any confusion this change may have caused. Please E-mail your model inquiries to: surviacmodels@bah.com

COVART 4.2.2 (Beta 3)

The next and final version of COVART 4.2.2 (Beta 3) will be released prior to the end of CY99. There have been significant corrections made to the Beta 2 version (released in March of 1999) due to the efforts of the Beta Testers. There will also be a first order MANPADS Vulnerability Assessment Capability included in the Beta 3 release. In order to receive the COVART 4.2.2 - Beta 3 CD-ROM a Memorandum of Agreement (MOA) must be on file at SURVIAC.

New Model Versions Released

The following models have recently released new versions. These models will be spotlighted in future editions of the SURVIAC Bulletin. For further information on these models, please contact Mr. Paul Jeng, Booz•Allen & Hamilton Inc., Com: (937) 431-2712 or by E-mail: surviacmodels@bah.com. In order to receive the CD-ROM for these models your Memorandum of Agreement (MOA) must be on file at SURVIAC.

- BRAWLER 6.4
- ALARM 4.1
- RADGUNS 2.2
- ESAMS 2.8.3
- BLUEMAX IV (see Model Spotlight on page ten)

Upcoming Model Meetings

The following is a list of upcoming model meetings. For more information on these meetings, please contact Mr. Paul Jeng, Booz•Allen & Hamilton Inc., Com: (937) 431-2712 or by E-mail: surviacmodels@bah.com. Also, visit our web site at: <http://iac.dtic.mil/surviac>.

ESAMS Beta Site Meeting

29 February 2000
AFIWC, San Antonio, Texas

JMASS Users & Analysts Group Meeting (JUG)

27-27 April 2000
Wright-Patterson AFB, Ohio

JTCG/AS Model User Meeting (JMUM) (formerly D'DEAF_CRAB)

27-30 June 2000
United States Air Force Academy, Colorado Springs, Colorado

BRAWLER and ESAMS concurrent meetings

28-30 November 2000
Nellis AFB, Nevada



JTCG/ME Air Target Geometry Repository

A repository of air target geometries of interest to the Joint Technical Coordinating Group for Munitions Effectiveness (JTCG/ME) and associated survivability/lethality community was established and now resides within SURVIAC.

Prior to the establishment of this repository, there was no configuration management of these models and there was no way to determine which descriptions were “official” JTCG/ME versions. A Configuration Management Plan (CMP) was developed in 1996 to alleviate this problem. The approved CMP provides specific direction for the set-up, operation, control, and maintenance of the air target geometry repository; methods for collection and approving target geometry data; receipt and acceptance guidance for recommending changes to existing geometries; and procedures for processing requests for geometries and data by users. This document is available as JTCG/ME document OP-VULN-98-1, Configuration Management Plan for JTCG/ME Air Target Geometric Descriptions, dated 31 December 1998. A SURVIAC TAT is currently in place to implement the CMP, establish the repository, collect and approve geometries, and distribute the geometries and associated geometry information to users.

A tri-Service Configuration Control Board (CCB) appointed by the JTCG/ME

Vulnerability Group was established for management and oversight of the Air Target Geometry (ATG) Repository. Current members of the CCB include representatives from NSWDD, AAC/XRW, ARL, NAIC and NGIC. A Memorandum of Understanding (MOU) between the CCB and SURVIAC was also established and is

in place outlining how the repository will be managed and supported within SURVIAC. As the repository custodian, SURVIAC is responsible for configuration management and administration of the repository.

The CCB has already evaluated and reviewed over 45 FASTGEN geometries, representing 13 fixed-wing aircraft (inflight), four fixed-wing (PTO), three rotary-wing aircraft, and varying configurations thereof. To date, 21 geometries have been approved and entered into the repository. The approved geometries include:

- MiG-29 Fulcrum
- SU-27 Flanker
- SU-20 Fitter (3 configurations), SU-20 Fitter PTO
- MiG-21 Fishbed (2 configurations), MiG-21 Fishbed PTO
- MiG-23 Flogger, MiG-23 Flogger PTO (2 versions)
- MiG-25 Foxbat (2 configurations)
- MiG-27 Flogger
- MiG-31 Foxhound



- TU-22 Backfire
- A-50 Mainstay
- TU-95 Bear
- TU-16 Badger
- Helix

Additional aircraft and missile geometries in FASTGEN and BRL-CAD formats will be considered for entry as they become avail-

Continued on page 14

For more information or to order a copy of the catalog, please contact Jeff Foulk at (410) 273-7722 or by E-mail at jeff@survice.com

able. Each of the geometries considered were evaluated to determine the quality of the geometry, number of components modeled for each system, and differences between the various versions of the same geometry. Available supporting data pertaining to the geometries, such as component code lists, material and density listings, intentional interference lists and README files were also examined. Where supporting data exists, they will be made available with the associated geometry.

The ATG Catalog provides a summary of the available geometries. This catalog includes a description of each geometry, external and internal views, summary of the evaluation results and point of contacts for additional information on the geometries.

OTHER TARGET GEOMETRY PRODUCTS

In addition to the JTCG/ME ATG Repository, there are three related target geometry products available to the community.

A Summary of Aerospace Vehicle Computerized Geometric Descriptions for Vulnerability Analyses, MAY 92, is a catalogue which contains a summary of target geometries of domestic aircraft, missiles, helicopters, satellites, target drones and components, as well as foreign aircraft and helicopters, missiles, and target drones. These target geometries were developed in MAGIC, SHOTGEN, FASTGEN3, GIFT, or SCAN formats. Some of the models in this catalog are available from SURVIAC. *Contact Sue Green, SURVIAC, Com: (937) 255-4840, DSN: 785-4840*

A Catalog of BRL-CAD Target Descriptions, AUG 94, contains information on target geometries of U.S. and foreign, helicopters, communications systems, power generation systems, missile systems, tracked and tactical wheeled vehicles, engineer equipment, and radar systems. These

target geometries were developed in the U.S. Army Research Laboratory's (ARL) BRL-CAD modeling system. Target geometries, including support and documentation, may be obtained by DoD agencies and DoD contractors from the ARL in accordance with AR 5-11. *Contact Keith Applin, ARL, Com: (410) 278-6647*

The Vulnerability Information System (VIS) Archive, JAN 99, functions as a centralized repository with an inherent process for retrieval of vulnerability data contained on a classified CD-ROM. It contains data on numerous domestic and foreign ground targets developed/analyzed using BRL-CAD, SHOTGEN, FASTGEN, PDAM, and other methods. Target vulnerability input criteria, such as critical component lists, weapon input criteria, and Failure Analysis Logic Trees (FALTs), etc., is also available. The archive will be updated as new descriptions and data become available, and will eventually include all ground TGMs that have been or will be developed under AAC/ENM or JTCG/ME sponsorship. *Contact Celeste Prohaska, AAC/ENMS, Com: (850) 882-9417.*

Call for Papers

Threats, Countermeasures, and Situational Awareness: Teaming for Survivability Symposium and Exhibition
June 20-22, 2000, Virginia Beach, Virginia



Those interested in submitting papers on operational issues, current research, design efforts, or technology specifically relating to any of the topic areas should indicate their intent to submit (title, topic area, executive summary, and a paragraph biography) by January 17, 2000. All executive summaries must be UNCLASSIFIED.

For further information contact:
Norm Papke, Naval Surface Warfare Center Crane Div.
Com: (812) 854-6835,
E-mail papke_norman@crane.navy.mil
or
Peggy Heffner, Naval Air Warfare Center Aircraft Div.
Com: (301) 342-9268
E-mail HeffnerPL@navair.navy.mil

Sponsored by the Electronic Warfare Advanced Technology (EWAT) Program
A combination of the Advanced Technology Electronic Defense Systems (ATEDS) Conference and the Tactical Situational Awareness (SA) Symposium

JANUARY

Winter Roundtable 2000

A DoD Roadmap for Precision Strike and Unmanned Systems for the Next Decade

January 12, 2000

Arlington, Virginia

POC: Leslie Mueller Com:(301) 475-6531 or

Bob Brown Com: (301) 737-6432

38th Aerospace Sciences Conference and Exhibition 2000

January 10-13, 2000

Reno, Nevada

POC: Howard O'Brien, AIAA

Com: (800) 739-4424, E-mail: howrdo@aiaa.org

2000 Meeting of the Military Sensing Symposium (MSS) Specialty Group on Missile Defense Sensors, Environment, and Algorithms

January 25-27, 2000

Charleston, South Carolina

POC: Rose Coleman

Com: (734) 994-1200 ext. 2821/2881

LO Shortcourse Fundamentals of Low Observable Technology

January 25-28, 2000

Wright-Patterson AFB, Ohio

POC: Dr. Brian Kent

Com: (937) 255-0277, DSN: 785-0277

Tactical Wheeled Vehicles Conference

January 29 - February 1, 2000

Monterey, California

POC: National Defense Industrial Association (NDIA), Event #053

Com: (703) 522-1820, FAX: (703) 522-1885, E-mail: mmccrory@ndia.com

Online Registration: www.ndia.org

West 2000

February 10-11, 2000

San Diego Convention Center, San Diego, California

POC: Armed Forces Communications and Electronics Association (AFCEA)

Com: (703) 631-6100 or (800) 336-4583, Web: www.afcea.org

FEBRUARY

Missiles and Rockets Symposium

February 22-24, 2000

San Diego, California

POC: National Defense Industrial Association (NDIA), Event #063

COM: (703) 522-1820, FAX: (703) 522-1885, E-mail: fbajowski@ndia.org

16th Annual Test & Evaluation National Conference

February 27-March 2, 2000

Vancouver, Canada

POC: National Defense Industrial Association (NDIA), Event #09

COM: (703) 522-1820, FAX: (703) 522-1885, E-mail: ccrane@ndia.org

Check out our SURVIAC web site for updates on these and other events!
<http://iac.dtic.mil/surviac>

Subscribe to the JTCG/AS Aircraft Survivability Newsletter



Contact Linda Ryan
SURVIAC
Com: (937) 255-4840
DSN: 785-4840
E-mail: liryan@bah.com

SURVIAC Distribution/Information Request

- ☐ Change the Distribution Information as Shown Below
- ☐ Add My Organization to the SURVIAC Bulletin Distribution List
- ☐ Add My Organization to the JTCG/AS Aircraft Survivability Newsletter
- ☐ Request SURVIAC Technical Area Task Information (Government)
- ☐ Request SURVIAC Subscription Plan Information Package (Industry)
- ☐ Request SURVIAC Product Guide ☐ Request SURVIAC Model Guide

NAME: _____

TITLE _____

COMPANY/ORG _____

DIVISION _____

ADDRESS _____

CITY/STATE/ZIP _____

COUNTRY _____

DSN _____

COM _____

FAX _____

E-mail _____

SERVICE : ☐ USA ☐ USAF ☐ USN ☐ USMC ☐ DoD ☐ Contractor

Return to: Linda Ryan, AFRL/VACS/SURVIAC, Bldg. 45, 2130 Eighth St.
Ste. 1, Wright-Patterson AFB, Ohio 45433-7542

Com: (937) 255-4840, DSN: 785-4840, FAX: (937) 255-9673

E-mail: liryan@bah.com

For further information on how to obtain products and how to establish need-to-know certification, please contact SURVIAC at (937) 255-4840, FAX (937) 255-9673. Requests from non-U.S. agencies must be forwarded to their country's Embassy in Washington, D.C., Attn: Air Attache's Office.

SURVIAC

AFRL/VACS/SURVIAC, Bldg. 45
2130 Eighth Street, Ste. 1
Wright-Patterson AFB, OH 45433-7542

BULK RATE
U.S. POSTAGE PAID
DAYTON OHIO
PERMIT NO. 1161